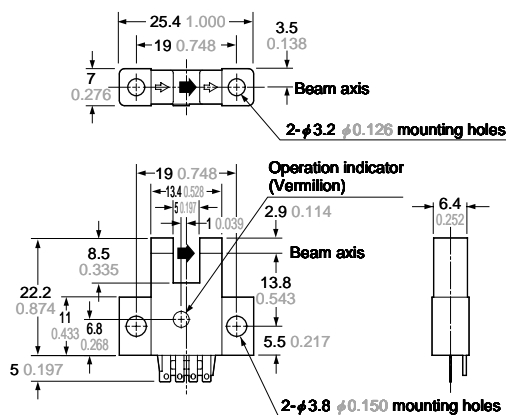


## U-shaped Micro Photoelectric Sensor

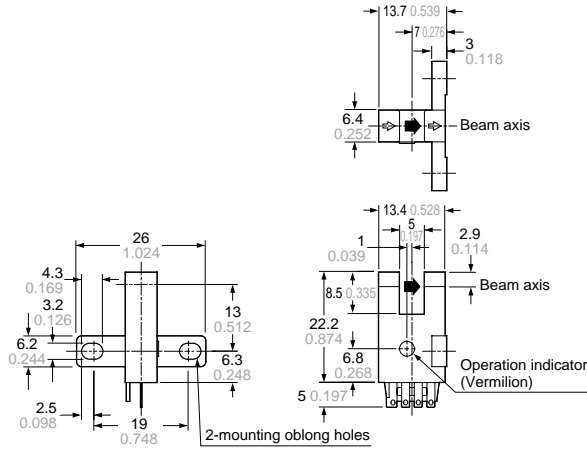
The ultra-small PM series of u-shaped photoelectric sensors provides a wide range of 29 different models to suit any of your application needs. With the industry's smallest size, the PM series plays a key role in the miniaturization of your equipment. All models are equipped with two outputs, one for **Light-ON** and the other for **Dark-ON** sensing. This increases the versatility of the sensor for use in existing applications. The series is also available in a connector type to maximize ease of installation and allow for wire replacement if the cable is severed. The PM series conforms to the European EMC Directive and carries UL Recognition. Both NPN and PNP transistor output models are available.

Model Name	Type	Output Operation	Output Configuration	Emitting Element	Max. Range (mm)	Max. Range (in)	Quick Disconnect
Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼
PM-F54	Small F-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-K54	Small K-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-L54	Small L-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-R54	Small R-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-T54	Small T-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-Y54	Small Y-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector

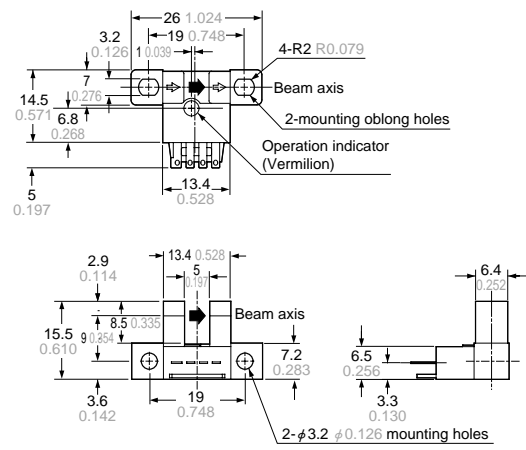
### PM-K54 PM-K54P Sensor



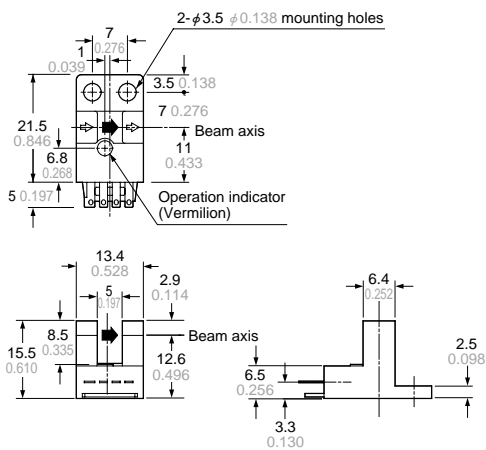
**PM-T54  
PM-T54P** Sensor



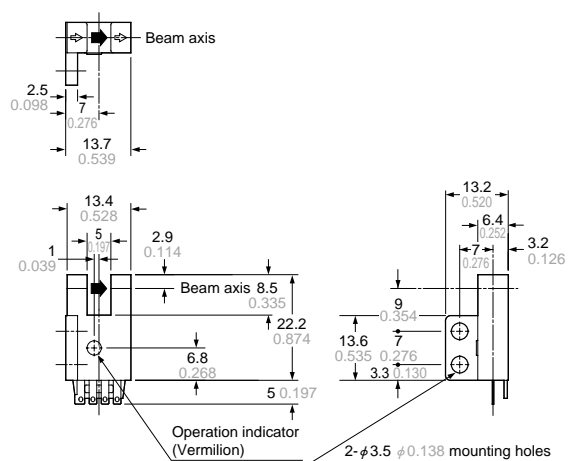
**PM-L54  
PM-L54P** Sensor



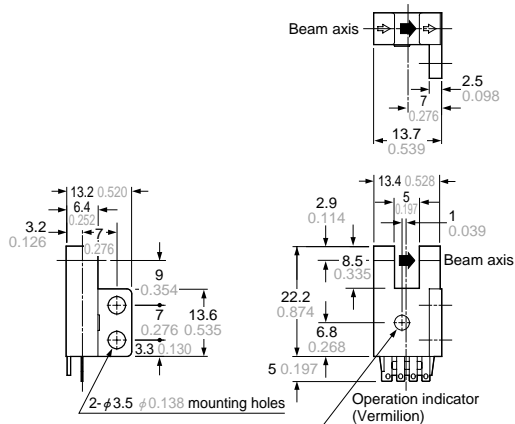
**PM-Y54  
PM-Y54P** Sensor



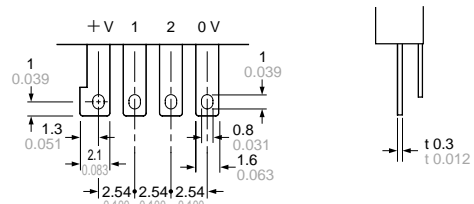
**PM-F54  
PM-F54P** Sensor



**PM-R54  
PM-R54P** Sensor



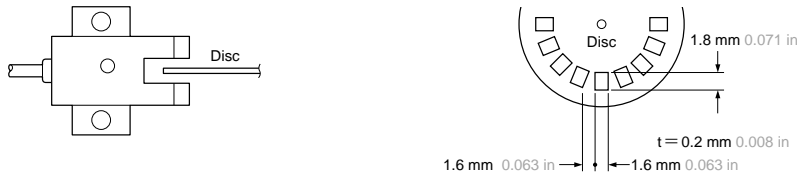
※Terminal part (PM-□54, PM-□54P)



## SPECIFICATIONS

Item	Type		Ultra-small		Small			
	Model No.	NPN output type	With flexible cable	With cable	With cable	With connector		
		PNP output type						
			<b>PM-□24</b>	<b>PM-□24-R</b>	<b>PM-□44</b>	<b>PM-□54</b>		
					<b>PM-□44P</b>	<b>PM-□54P</b>		
Sensing range			5 mm 0.197 in (fixed)					
Minimum sensing object			0.8 × 1.8 mm 0.031 × 0.071 in opaque object					
Hysteresis			0.05 mm 0.002 in or less					
Repeatability			0.03 mm 0.001 in or less					
Supply voltage			5 to 24 V DC ± 10 % Ripple P-P 10 % or less					
Current consumption			15 mA or less					
Output			<NPN output type> NPN open-collector transistor		<PNP output type> PNP open-collector transistor			
			<ul style="list-style-type: none"> <li>• Maximum sink current: 50 mA</li> <li>• Applied voltage: 30 V DC or less (between output and 0 V)</li> <li>• Residual voltage: 0.7 V or less (at 50 mA sink current)</li> </ul>		<ul style="list-style-type: none"> <li>• Maximum source current: 50 mA</li> <li>• Applied voltage: 30 V DC or less (between output and + V)</li> <li>• Residual voltage: 0.7 V or less (at 50 mA source current)</li> </ul>			
Utilization category			DC-12 or DC-13					
Output operation			Incorporated with 2 outputs: Light-ON / Dark-ON					
Response time			Under light received condition: 20 μs or less Under light interrupted condition: 100 μs or less (Response frequency: 1 kHz or more)(Note 1)					
Operation indicator			Vermilion LED (lights up under light received condition)					
Environmental resistance			Pollution degree				3 (Industrial environment)	
			Ambient temperature (Note 2, 3)				- 25 to + 55 °C - 13 to + 131 °F (No dew condensation or icing allowed), Storage: - 30 to + 80 °C - 22 to + 176 °F	
			Ambient humidity				35 to 85 % RH, Storage: 35 to 85 % RH	
			Ambient illuminance				Fluorescent light: 1,000 lx at the light-receiving face	
			EMC				EN 50081-2, EN 50082-2, EN 60947-5-2	
			Voltage withstandability				1,000 V AC for one min. between all supply terminals connected together and enclosure	
			Insulation resistance				50 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure	
			Vibration resistance				10 to 2,000 Hz frequency, 1.5 mm 0.059 in amplitude in X, Y and Z directions for two hours each	
Shock resistance				15,000 m/s <sup>2</sup> acceleration (1,500 G approx.) in X, Y and Z directions for three times each				
Emitting element			Infrared LED (non-modulated)					
Material			Enclosure: PBT, Slit cover: Polycarbonate, Terminal part <b>PM-□54(P)</b> only): Solder plated					
Cable			0.09 mm <sup>2</sup> 4-core cabtyre cable <b>PM-□24-R</b> : 0.1 mm <sup>2</sup> flexible, oil and heat resistant cabtyre cable (Note 4), 1 m 3.281 ft long					
Cable extension			Extension up to total 100 m 328.084 ft is possible with 0.3 mm <sup>2</sup> , or more, cable.					
Weight			10 g approx.		15 g approx. 3 g approx.			

Notes: 1) The response frequency is the value when the disc, given in the figure below, is rotated.



2) In case the ultra-small type **PM-□24(-R)** is used at an ambient temperature of + 50 °C + 122 °F, or more, make sure to mount it on a metal body.

3) Take care that the flexibility of the **PM-□24-R** cable is lost if the ambient temperature is near - 10 °C + 14 °F.

4) The cable of **PM-□24-R** is a flexible cable usable on a moving base. When the sensor is mounted on a moving base, fix the sensor cable joint so that stress is not applied to it.